tutorial6	2011-01-12 18:18:30 +0000					
Variables						
dp						
	DeltaP	50 Kpa				
	50.00000	Kpa				
dt						
	DeltaT	5 C				
	5.00000	C				
ggduty						
	Input Sources	salesgas	lts			
	Q	@salesgas - @lts.v				
	55197.59045	W				
Fluids						
feed						
	T	10 C				
	P	4000 kPa				
	F	10 mmscfd				
	X	[70,20,10,9,8,7,6,5]				
			Bulk	Vapour	Liquid	
	Vf		0.53454	0.53454	0.46546	
	T	C	10.00000	10.00000	10.00000	
	P	kPa	4000.00000	4000.00000	4000.00000	
	F	kgmole/h	498.04060	266.22212	231.81848	
	H	W-hr/kgmole	850.28512	2434.89588	-969.49404	
	S	kJ/kmol-K	160.02798	159.63944	160.47417	
	X					
	METHANE		0.51852	0.80942	0.18444	
	ETHANE		0.14815	0.13855	0.15917	
	PROPANE		0.07407	0.03441	0.11962	
	n-BUTANE		0.06667	0.01195	0.12950	
	n-PENTANE		0.05926	4.06E-03	0.12265	
	n-HEXANE		0.05185	1.11E-03	0.11013	
	n-HEPTANE		0.04444	3.71E-04	0.09506	
	n-OCTANE		0.03704	1.19E-04	0.07943	
lts						
	Input Sources	dp	feed			
	T	-10 C				
	P	@feed - 2 * $dp				
	F	@feed.v				
	X	@feed.v				
			Bulk	Vapour	Liquid	
	Vf		0.98546	0.98546	0.01454	
	T	C	-10.00000	-10.00000	-10.00000	
	P	kPa	3900.00000	3900.00000	3900.00000	
	F	kgmole/h	266.22212	262.35119	3.87093	
	H	W-hr/kgmole	2116.84726	2164.22719	-1094.31101	
	S	kJ/kmol-K	155.61266	155.89926	136.18847	
	X					
	METHANE		0.80942	0.81797	0.23002	
	ETHANE		0.13855	0.13737	0.21877	
	PROPANE		0.03441	0.03241	0.17011	
	n-BUTANE		0.01195	9.60E-03	0.17123	
	n-PENTANE		4.06E-03	2.32E-03	0.12220	
	n-HEXANE		1.11E-03	2.81E-04	0.05708	
	n-HEPTANE		3.71E-04	4.14E-05	0.02274	
	n-OCTANE		1.19E-04	5.03E-06	7.85E-03	
dewpt						
	Input Sources	lts				
	P	800 psig				
	Vf	1				
	F	@lts.v				
	X	@lts.v				
			Bulk	Vapour	Liquid	
	Vf		1.00000	1.00000	0.00000	
	T	C	-9.88043	-9.88043	-9.88043	
	P	kPa	5617.13060	5617.13060	5617.13060	
	F	kgmole/h	262.35119	262.35119	0.00000	
	H	W-hr/kgmole	1970.39562	1970.39562	-563.69897	
	S	kJ/kmol-K	150.92708	150.92708	133.47797	
	X					
	METHANE		0.81797	0.81797	0.34086	
	ETHANE		0.13737	0.13737	0.24614	
	PROPANE		0.03241	0.03241	0.15980	
	n-BUTANE		9.60E-03	9.60E-03	0.13177	
	n-PENTANE		2.32E-03	2.32E-03	0.07838	
	n-HEXANE		2.81E-04	2.81E-04	0.03003	
	n-HEPTANE		4.14E-05	4.14E-05	0.01010	
	n-OCTANE		5.03E-06	5.03E-06	2.92E-03	
salesgas						
	Input Sources	lts	feed	dp	dt	
	T	@feed - $dt				
	P	@lts - $dp				
	F	@lts.v				
	X	@lts.v				
			Bulk	Vapour	Liquid	
	Vf		1.00000	1.00000	0.00000	
	T	C	5.00000	5.00000	5.00000	
	P	kPa	3850.00000	3850.00000	3850.00000	
	F	kgmole/h	262.35119	262.35119	0.00000	
	H	W-hr/kgmole	2374.62300	2374.62300	-255.16775	
	S	kJ/kmol-K	158.78753	158.78753	140.60625	
	X					
	METHANE		0.81797	0.81797	0.31292	
	ETHANE		0.13737	0.13737	0.23657	
	PROPANE		0.03241	0.03241	0.16242	
	n-BUTANE		9.60E-03	9.60E-03	0.14275	
	n-PENTANE		2.32E-03	2.32E-03	0.09125	
	n-HEXANE		2.81E-04	2.81E-04	0.03656	
	n-HEPTANE		4.14E-05	4.14E-05	0.01336	
	n-OCTANE		5.03E-06	5.03E-06	4.18E-03	
chillfeed	Chiller Feed					
	Input Sources	ggduty	dp	feed		
	P	@feed - $dp				
	H	(@feed.v.Q - $ggduty) / @feed.v.F				
	F	@feed.v				
	X	@feed.v				
			Bulk	Vapour	Liquid	
	Vf		0.99290	0.99290	7.10E-03	
	T	C	-3.43129	-3.43129	-3.43129	
	P	kPa	3950.00000	3950.00000	3950.00000	
	F	kgmole/h	266.22212	264.33281	1.88931	
	H	W-hr/kgmole	2227.55927	2251.09675	-1065.57087	
	S	kJ/kmol-K	157.02371	157.12662	142.62556	
	X					
	METHANE		0.80942	0.81368	0.21358	
	ETHANE		0.13855	0.13813	0.19776	
	PROPANE		0.03441	0.03357	0.15261	
	n-BUTANE		0.01195	0.01087	0.16315	
	n-PENTANE		4.06E-03	3.12E-03	0.13578	
	n-HEXANE		1.11E-03	5.23E-04	0.08283	
	n-HEPTANE		3.71E-04	9.32E-05	0.03930	
	n-OCTANE		1.19E-04	1.29E-05	0.01498	
stabovhd	Stabilizer Overheads					
	Input Sources	stab				
	P	#stab.0.p				
	Vf	1				
	F	#stab.0.v.f				
	X	#stab.0.v.x				
			Bulk	Vapour	Liquid	Liquid2
	Vf		1.00000	1.00000	0.00000	0.00000
	T	C	-3.79578	-3.79578	-3.79578	-3.79578
	P	kPa	700.00000	700.00000	700.00000	700.00000
	F	kgmole/h	119.03742	119.03742	0.00000	0.00000
	H	W-hr/kgmole	2858.77344	2858.77344	-1504.83512	374.09541
	S	kJ/kmol-K	178.36116	178.36116	119.25363	136.79837
	X					
	METHANE		0.36667	0.36667	0.01957	0.36667
	ETHANE		0.31708	0.31708	0.11705	0.31708
	PROPANE		0.23848	0.23848	0.37002	0.23848
	n-BUTANE		0.07753	0.07753	0.48898	0.07753
	n-PENTANE		2.33E-04	2.33E-04	4.36E-03	2.33E-04
	n-HEXANE		1.76E-07	1.76E-07	1.80E-05	1.76E-07
	n-HEPTANE		1.24E-09	1.24E-09	3.94E-07	1.24E-09
	n-OCTANE		5.67E-12	5.67E-12	0.00000	5.67E-12
stabbtms	Stabilizer Bottoms					
	Input Sources	stab				
	P	#stab._1.p				
	Vf	0				
	F	#stab._1.l.f				
	X	#stab._1.l.x				
			Bulk	Vapour	Liquid	
	Vf		0.00000	0.00000	1.00000	
	T	C	123.71142	123.71142	123.71142	
	P	kPa	750.00000	750.00000	750.00000	
	F	kgmole/h	116.65199	0.00000	116.65199	
	H	W-hr/kgmole	4390.03501	9356.47391	4390.03501	
	S	kJ/kmol-K	249.52077	263.44376	249.52077	
	X					
	METHANE		1.69E-13	0.00000	1.69E-13	
	ETHANE		2.77E-09	2.89E-08	2.77E-09	
	PROPANE		1.19E-05	6.13E-05	1.19E-05	
	n-BUTANE		0.18392	0.45751	0.18392	
	n-PENTANE		0.24755	0.31380	0.24755	
	n-HEXANE		0.22075	0.13714	0.22075	
	n-HEPTANE		0.18966	0.06327	0.18966	
	n-OCTANE		0.15812	0.02822	0.15812	
vpcheck	Check vapour pressure of stabilizer bottoms					
	Input Sources	stabbtms				
	P	1 atm				
	Vf	0				
	F	@stabbtms				
	X	@stabbtms				
			Bulk	Vapour	Liquid	
	Vf		0.00000	0.00000	1.00000	
	T	C	37.77778	37.77778	37.77778	
	P	kPa	101.32500	101.32500	101.32500	
	F	kgmole/h	116.65199	0.00000	116.65199	
	H	W-hr/kgmole	-750.63949	5977.81818	-750.63949	
	S	kJ/kmol-K	197.44352	231.77886	197.44352	
	X					
	METHANE		1.69E-13	0.00000	1.69E-13	
	ETHANE		2.77E-09	1.01E-07	2.77E-09	
	PROPANE		1.19E-05	1.35E-04	1.19E-05	
	n-BUTANE		0.18392	0.62356	0.18392	
	n-PENTANE		0.24755	0.27403	0.24755	
	n-HEXANE		0.22075	0.07327	0.22075	
	n-HEPTANE		0.18966	0.02241	0.18966	
	n-OCTANE		0.15812	6.59E-03	0.15812	
c3comp	Propane to Compressor					
	Input Sources	c3jt	lts	dt		
	T	@lts - $dt				
	Vf	1				
	F	@c3jt				
	X	[0,0,1,0,0,0,0,0]				
			Bulk	Vapour	Liquid	
	Vf		1.00000	1.00000	0.00000	
	T	C	-15.00000	-15.00000	-15.00000	
	P	kPa	291.39920	291.39920	291.39920	
	F	kgmole/h	10.36504	10.36504	0.00000	
	H	W-hr/kgmole	3229.39922	3229.39922	-1617.83830	
	S	kJ/kmol-K	182.32710	182.32710	114.73052	
	X					
	METHANE		0.00000	0.00000	0.00000	
	ETHANE		0.00000	0.00000	0.00000	
	PROPANE		1.00000	1.00000	1.00000	
	n-BUTANE		0.00000	0.00000	0.00000	
	n-PENTANE		0.00000	0.00000	0.00000	
	n-HEXANE		0.00000	0.00000	0.00000	
	n-HEPTANE		0.00000	0.00000	0.00000	
	n-OCTANE		0.00000	0.00000	0.00000	
c3jt	Propane to JT Valve					
	Input Sources	lts	c3jt	c3comp	chillfeed	
	T	45 C				
	Vf	0				
	F	(@chillfeed.Q - @lts.Q) / (@c3comp.H - @c3jt.H)				
	X	@c3comp				
			Bulk	Vapour	Liquid	
	Vf		0.00000	0.00000	1.00000	
	T	C	45.00000	45.00000	45.00000	
	P	kPa	1539.53450	1539.53450	1539.53450	
	F	kgmole/h	10.36504	0.00000	10.36504	
	H	W-hr/kgmole	385.80352	4018.72812	385.80352	
	S	kJ/kmol-K	139.37450	180.48255	139.37450	
	X					
	METHANE		0.00000	0.00000	0.00000	
	ETHANE		0.00000	0.00000	0.00000	
	PROPANE		1.00000	1.00000	1.00000	
	n-BUTANE		0.00000	0.00000	0.00000	
	n-PENTANE		0.00000	0.00000	0.00000	
	n-HEXANE		0.00000	0.00000	0.00000	
	n-HEPTANE		0.00000	0.00000	0.00000	
	n-OCTANE		0.00000	0.00000	0.00000	
c3cond	Propane to condenser					
	Input Sources	c3comp				
	P	#c3comp				
	H	#c3comp				
	F	#c3comp				
	X	#c3comp				
			Bulk	Vapour	Liquid	
	Vf		1.00000	1.00000	0.00000	
	T	C	65.21867	65.21867	65.21867	
	P	kPa	1589.53450	1589.53450	1589.53450	
	F	kgmole/h	10.36504	10.36504	0.00000	
	H	W-hr/kgmole	4525.66617	4525.66617	1303.14083	
	S	kJ/kmol-K	185.83968	185.83968	149.40558	
	X					
	METHANE		0.00000	0.00000	0.00000	
	ETHANE		0.00000	0.00000	0.00000	
	PROPANE		1.00000	1.00000	1.00000	
	n-BUTANE		0.00000	0.00000	0.00000	
	n-PENTANE		0.00000	0.00000	0.00000	
	n-HEXANE		0.00000	0.00000	0.00000	
	n-HEPTANE		0.00000	0.00000	0.00000	
	n-OCTANE		0.00000	0.00000	0.00000	
Tools						
hydrate	Hydrate					
	Input Sources	feed				
	Feed Fluid	feed				
	P	2052.67389	kPa			
envelope	Phase Envelope					
	Input Sources	feed				
	Source	feed.v				
stab	Tower	liquid stabilizer				
	Input Sources	vpcheck	lts	feed		
	Converged					
	NStages	15				
	Ovhd Flow Est	140 kgmole/h	140.00000	kgmole/h		
	Reflux Ratio Spec	1.0	1.00000			
	Feeds	Stage	Fluid			
		4	feed.l			
		7	lts.l			
	Energy Flows	Stage	Q W	Spec		
		0	-736638.51387	(@vpcheck.t - {fromunit "f" "t" 100}) / 500		
		-1	1818029.81834			
	Stage	T C	P kPa	V kgmole/h	L kgmole/h	
	0	-3.79492	700.00000	119.03742	119.03746	
	1	25.75416	703.57143	238.07488	122.90144	
	2	34.59681	707.14286	241.93886	121.69085	
	3	39.35367	710.71429	240.72827	111.36407	
	4	50.09965	714.28571	230.40149	337.38259	
	5	71.22186	717.85714	224.60153	385.25067	
	6	75.90919	721.42857	272.46962	395.93640	
	7	77.61492	725.00000	283.15534	403.18410	
	8	78.93713	728.57143	286.53211	405.45163	
	9	79.87841	732.14286	288.79964	405.52885	
	10	81.14479	735.71429	288.87686	403.81886	
	11	83.47176	739.28571	287.16688	398.62386	
	12	88.41410	742.85714	281.97188	385.58070	
	13	99.60009	746.42857	268.92872	358.73876	
	14	123.71142	750.00000	242.08678	116.65199	
c3comp	Compressor/ Expander	Propane Compressor				
	Input Sources	c3comp	c3jt	dp		
	Feed Fluid	c3comp				
	OutletP	@c3jt + $dp	1589.53450	kPa		
	Efficiency	75	75.00000			
	Power	13435.85861	W			
	PolyEff	0.78052				